**Before the**

**FEDERAL COMMUNICATIONS COMMISSION**



| | | |
|---|---|---|
| In the Matter of | ) | |
| | ) | |
| Service Rules for the 746-764 and | ) | WT Docket No. 99-168 |
| 776-794 MHz Bands, and Revisions to | ) | |
| Part 27 of the Commission's Rules | ) | |



# REPLY COMMENTS OF METRICOM, INC.

Metricom, Inc. ("Metricom"), by its attorneys, pursuant to § 1.415 of the Commission's rules, hereby replies to the comments filed in the above-captioned proceeding. As discussed more fully below, Metricom urges the Commission to adopt simple, flexible use rules for the subject frequency bands while precluding broadcast services in the bands. Metricom also requests that the Commission consider allocating this spectrum on a nationwide basis and employ a novel, innovative fee system based on per-unit equipment deployment.

## I. Background.

Metricom, based in Silicon Valley, has deployed its highly successful Ricochet[1] wireless Internet access service, serving approximately 30,000 subscribers, using unlicensed spread-spectrum transmitters operating pursuant to Part 15 of the Commission's rules in several metropolitan areas, including Washington, D.C., San Francisco and Silicon Valley, Seattle, and several airports and universities. In 1997, Metricom purchased a number of WCS licenses at auction, and Metricom is now preparing to roll out its second-generation Ricochet2 using WCS

1. Ricochet is a registered trademark of Metricom, Inc.

transmitters to achieve more than a fourfold increase in subscriber bandwidth. The new generation of equipment operates at a gross over-the-air transmission rate of up to 1 Mbps, and provides user data rates of up to 128 kbps. Metricom recently received a $600 million investment from Vulcan Ventures, Inc. and MCI Worldcom, Inc., and is aggressively seeking to expand the coverage and capacity of its wireless network using a combination of licensed and unlicensed spectrum.

## II. The Commission Should Apply Flexible Use Rules to the 746-764 and 776-794 MHz Bands, Similar to Those for Part 27 WCS.

As a Licensee of WCS spectrum covering a significant portion of the United States, Metricom is a strong advocate of flexible use rules such as the Part 27 rules applicable to WCS. Metricom strongly disagrees with commenters who suggest that flexible use rules have somehow failed to stimulate the development and deployment of WCS equipment.[2] Metricom has designed a sophisticated network architecture incorporating WCS transmitters to handle a portion of its wireless backhaul and free up unlicensed frequencies for subscriber transmissions. Metricom's equipment development effort has proceeded according to timetable, and today -- only two years from the WCS auction -- Metricom is poised to deploy WCS transmitters and receivers on a nearly national scale. This rapid development and integration into Metricom's existing wireless network was made possible by the flexible use rules of Part 27, allowing Metricom to choose bandwidths, channelizations, and emission characteristics to meet its own needs rather than to conform to some fixed template mandated by the rules.

---

2. *See* Comments of PCIA at 2 (too flexible a service allocation will deter investment); Comments of Motorola at 3 ("underwhelming success" of WCS should discourage FCC from reusing the WCS rules); Comments of ITA at ¶ 9 (too much flexibility promotes uncertainty in the marketplace).

To the extent that the WCS auction can be considered a revenue-producing disappointment, any shortcomings can be traced to three major causes. First, there was minimal bandwidth available -- only two blocks with 10 MHz and two blocks with 5 MHz. This minimal amount of spectrum could only make the allocation attractive for large scale implementation if a specific plan were in place. Because of the congressionally mandated expedited auction of this spectrum, it was difficult to develop a business plan for the allocation.

Second, the Commission had just completed auctions for the broadband PCS C block (July, 1996), broadband PCS D, E, and F blocks (January, 1997), and cellular unserved areas (January 1997). These auctions resulted in a temporary oversupply of spectrum for fixed and mobile wireless applications. Moreover, auction winners had already begun to default on their payments,[3] giving rise to difficulty in financing the purchase of new spectrum at auction.

Third, certain onerous restrictions imposed upon WCS operations made the spectrum unattractive to many potential licensees. Specifically, WCS licensees are required to assume financial responsibility for remedying some cases of block downconverter overload interference to MDS and ITFS operations in nearby bands, and are required to suppress emissions into the adjacent Satellite DARS band to extremely low levels.[4] These restrictions do not encumber the 746-764 and 776-794 MHz bands since these bands are separated from the protected bands by nearly 2 GHz.

Not only have flexible use rules not failed in the case of WCS, flexible use rules clearly have the potential to promote efficient spectrum use. With current spread spectrum technologies, multiple

---

3. *See* FCC Report to Congress on Spectrum Auctions, 13 FCC Rcd 9601, 9632-33 (1997).

4. *See* Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service ("WCS"), *Report and Order*, 12 FCC Rcd 10785, ¶ 136 (1997).

independent uses can share a single spectrum band. Code-spreading and frequency hopping, as prescribed by the Commission for operation pursuant to Part 15, facilitate spectrum sharing between multiple uses.[5] For inspiration, the Commission might look to the Personal Handiphone System ("PHS") wireless communications service in Japan. PHS uses dynamic channel allocation to allow the more efficient use of available spectrum channels and permit different systems to exist side by side.[6] The Commission should prescribe simple rules for the 746-764 and 776-794 MHz bands that will effectively permit multiple uses in the bands by any operator who follows the rules.

## III. The Commission Should Not Permit New Broadcast Services in the 746-764 and 776-794 MHz Bands.

A number of commenters point out the difficulties in sharing adjacent bands between traditional broadcast and broadband wireless operations.[7] Metricom agrees. The Commission should not permit new broadcast services in the 746-764 and 776-794 MHz bands. The difficulties of combining traditional broadcasting concepts with broadband wireless operations are nearly insurmountable. The Commission's recent attempt to combine point-to-multipoint operations and broadband wireless communications in the ITFS/MDS two-way proceeding has resulted in operating and engineering rules so overprotective and complex that as a practical matter licensees will be

---

5. *See* 47 C.F.R. § 15.247. However, the Commission should not create a "spectrum etiquette" as it did in the case of Narrowband PCS. *See* 47 C.F.R. § 15.321-323. Such rules effectively impose the Commission's choice of technology on the users of the band and lead to inefficient spectrum use.

6. *See, e.g.*, Dr. Kamel Maamria, *Japan's Personal Handiphone System Takes Off*, CELLULAR & MOBILE INTERNATIONAL, May-June 1996.

7. *See* Comments of Airtouch at 4; Comments of U S West at 7-8; Comments of TIA at ¶ 12; Comments of Motorola at 8-11; Comments of Intek Global Corp. at 4.

forced to obtain the consent of co-channel and adjacent-channel licensees in order to apply for new or modified facilities.[8] Permitting mobile transmitters would add yet another layer of complexity to this already unwieldy engineering environment.

Prohibiting broadcast operations in the 746-764 and 776-794 MHz bands is consistent with flexible use. Indeed, the principle behind flexible use -- simple rules to facilitate spectrum sharing -- would be turned on its head by any attempt to combine the very different interference rules associated with broadcasting and broadband wireless communications. The complexity of the combined rules would discourage innovative uses of the 746-764 and 776-794 MHz bands and depress investment in technology development for the bands. This would violate the flexible use provisions of Section 303(y) of the Act.[9] The alternative, throwing caution to the wind and letting competing users sort out the inevitable interference, would likewise be a violation.[10]

Protection of incumbent broadcasters in the 746-764 and 776-794 MHz bands may prove to be a significant restriction on new licensees in these bands. The Commission should permit agreements between licensees to migrate existing broadcast operations into the core broadcast band of TV channels 2-51.[11] In addition, the Commission should take affirmative steps to encourage the

---

8. *See* Amendment of Parts 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Fixed Two-Way Transmissions, *Report and Order*, 13 FCC Rcd 19112 (1998), Report and *Order on Reconsideration*, FCC 99-178 (rel. Jul. 29, 1999).

9. *See* 47 U.S.C. § 303(y)(2)(B) (requiring a Commission finding that a proposed flexible use would not deter investment).

10. *See* 47 U.S.C. § 303(y)(2)(C) (requiring a Commission finding that a proposed flexible use would not result in harmful interference among users).

11. Metricom specifically disagrees with the National Translator Association's suggestion that (continued...)

early migration of incumbent broadcast licensees in order to facilitate the rapid delivery of broadband wireless services in the 746-764 and 776-794 MHz bands to the public.

## IV. The Commission Should Create a Nationwide License in the 746-764 and 776-794 MHz Bands and Should Impose a Per-Unit Payment When Equipment Is Deployed.

### A. The Commission Should Award a Single Nationwide License.

Metricom recommends that the Commission auction the two blocks of spectrum in the 746-764 and 776-794 MHz bands in one nationwide license. This would provide a number of benefits. First, it would relieve the Commission of the need to create rules regulating interference between adjacent channels and adjacent geographic markets.[12] Instead, if the sole licensee desired to subdivide its allotment in either the frequency or geographic domain, it could work out the interference criteria in the marketplace. Second, it would shift the choice of single-channel or paired-frequency operation from the Commission to the market. As demonstrated in the comments, innovative and efficient use of the spectrum can be made without paired frequencies.[13] The goal of efficient spectrum use dictates that these kinds of decisions should be left to the market.[14] Second,

---

11. (...continued)
such agreements be prohibited. *See* Comments of NTA at 2-3.

12. *See* Comments of Airtouch at 19 (the Commission should authorize service over large regional or national service areas); Comments of U S West at 6 (Commission should allot 24 MHz of spectrum in one nationwide license).

13. For example, time division duplex (TDD) operation can divide a single channel into upstream and downstream paths based on time, thus eliminating the need for frequency separation between upstream and downstream paths. *See* Comments of Arraycomm at 5-6.

14. The Commission should at a minimum reconsider its tentative conclusion to license the spectrum on a paired-frequency basis. While certain traditional two-way applications may be well-suited to paired-frequency operation, restricting licensees to such operation is backward-looking and not in keeping with flexible use. The Commission should use its rules (continued...)

auctioning the spectrum in a single block would satisfy the concerns expressed by several commenters that too much fragmentation discourages investment in equipment.[15] A single nationwide licensee, coordinating the widespread deployment of equipment and service, should be able to provide equipment manufacturers the volume and term commitments they need to embark on the costly research and development programs necessary to develop innovative new products.

### B. The Commission Should Impose a Per-Unit Equipment Fee To Augment the One-Time Auction Payment

Awarding a nationwide license may have two adverse effects on the auction process. First, the financial requirements necessary to become a nationwide licensee may place the license beyond the reach of many smaller companies. Second, by reducing the field of potential bidders, a single license may decrease competition for the license and reduce the overall revenues raised by the auction.

Metricom proposes an innovative plan to alleviate these concerns. The Commission should require the successful bidder to make a payment to the U. S. Treasury for each transmitter deployed. The payment due upon the deployment of a particular unit should be proportional to the product of the transmitter power of the unit (expressed in dB) multiplied by the transmission bandwidth occupied by the unit. In this manner, low-power equipment, and equipment that uses relatively little bandwidth, is taxed at a lower rate than high-power or wider band equipment. The licensee should submit reports to the Commission on a periodic basis detailing the status of the equipment

---

14. (...continued)
to encourage the development of efficient new transmission techniques, not freeze existing technology in place.

15. *See, e.g.*, Comments of U.S. West at 3-4, Comments of Airtouch at 18-19.

deployment in the 746-764 and 776-794 MHz bands, and the per-unit payments for any equipment units deployed since the last report would be due at that time.

The effect of these per-unit payments would be to decrease the revenue received by the U.S. Treasury in the initial spectrum auction, because, all other things being equal, a spectrum allocation that is conditioned upon a future payment stream will be less valuable than one that is not. If the initial revenue decrease were significant enough, it would open the auction to many more bidders whose participation would have been foreclosed by a large lump-sum payment. This increased competition would benefit the auction process. In addition, the decrease in initial auction revenues would tend to be offset by the future revenue stream that would be generated for the Treasury as equipment is deployed in the 746-764 and 776-794 MHz bands. Indeed, the equipment fee could result in a windfall to the Treasury if the services offered are extremely successful. In any event, a per-unit equipment fee would ensure that the payment received by the Treasury is proportional to the success of the licensee in developing services that are beneficial to the public.

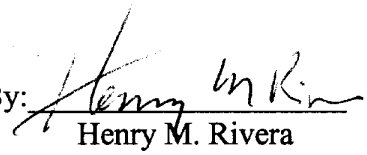
## V. Conclusion.

For the reasons stated herein, Metricom urges the Commission to adopt flexible use rules for the 746-764 and 776-794 MHz bands. Such rules should not, however, permit the use of these frequencies for broadcast services. To further encourage the most efficient use of these frequencies, Metricom further requests that the Commission consider allocating this spectrum in nation-wide

licenses, using a novel, innovative fee system based on per-unit equipment deployment.

Respectfully submitted,

METRICOM, INC.

By: 

Henry M. Rivera
Larry S. Solomon
J. Thomas Nolan
SHOOK, HARDY & BACON L.L.P.
Hamilton Square
600 14th Street, N.W.
Suite 800
Washington, D.C. 20005-2004
(202) 783-8400

ITS ATTORNEYS

Dated: August 13, 1999

## CERTIFICATE OF SERVICE

I, Kay D. Dallosta certify that I have sent a copy of the foregoing "**REPLY COMMENTS OF METRICOM, INC.** " by first class mail on August 13, 1999, postage prepaid, to each of the following:

George R. Borsari, Jr., Esq.
Borsari & Paxson
2021 L Street, N.W.
Suite 402
Washington, D.C. 20036

Jeffrey A. Brueggerman, Esq.
US West, Inc.
1801 California Street
Suite 5100
Denver, CO 80202

Deborah Lipoff, Esq.
Rand McNally & Company
8255 North Central Park
Skokie, IL 60076

Jonathan L. Wiener, Esq.
Goldberg, Godles, Wiener & Wright
1229 Nineteenth Street, N.W.
Washington, D.C. 20036

Mark E. Crosby
Laura L. Smith
Industrial Telecommunications Association
1110 N. Glebe Road, Suite 500
Arlington, VA 22201

Richard C. Barth
Leigh M. Chinitz
Motorola, Inc.
1350 I Street, N.W.
Washington, D.C. 20005

Pamela J. Riley
David A. Gross
AirTouch Communications, Inc.
1818 N Street, N.W.
Suite 800
Washington, D.C. 20036

Lawrence R. Sidman, Esq.
David R. Siddall, Esq.
Verner, Liipfert, Bernhard, McPherson & Hand
901 15th Street, N.W.
Suite 700
Washington, D.C. 20005

Jill Lyon, Esq.
American Mobile Telecommunications Association, Inc.
1150 18th Street, N.W., Suite 250
Washington, D.C. 20036

Carole C. Harris, Esq.
Christine M. Gill, Esq.
Daniel R. Ball, Esq.
McDermott, Will & Emery
600 13th Street, N.W.
Washington, D.C. 20005-3096

Michael D. Rosenthal, Esq.
Southern Communications Services, Inc.
5555 Glenridge Connector, Suite 500
Atlanta, GA 30342

Marilyn Mohrman-Gillis
Lonna M. Thompson
Association of America's Public Television Stations
1350 Connecticut Avenue, N.W., Suite 200
Washington, D.C. 20036

Jonathan D. Blake, Esq.
Ellen P. Goodman, Esq.
Christine E. Enemark, Esq.
Covington & Burling
1201 Pennsylvania Avenue, N.W.
Washington, D.C. 20044

Jeffrey L. Timmons, Esq.
Irwin, Campbell & Tannenwald, P.C.
1730 Rhode Island Avenue, N.W.
Suite 200
Washington, D.C. 20036-3101

Charles R. Naftalin, Esq.
Julie A. Barrie, Esq.
Koteen & Naftalin, L.L.P.
1150 Connecticut Avenue, N.W.
Suite 100
Washington, D.C. 20036

Raul R. Rodriguez, Esq.
Stephen D. Baruch, Esq.
Leventhal, Senter & Lerman P.L.L.C.
2000 K Street, N.W.
Suite 600
Washington, D.C. 20006

Derek R. Khlopin, Esq.
Grant E. Seiffert
Telecommunications Industry Association
1300 Pennsylvania Avenue, N.W.
Suite 350
Washington, D.C. 20004

Brett Kilbourne, Esq.
UTC
1140 Connecticut Avenue, N.W.
Suite 1140
Washington, D.C. 20036

William K. Keane, Esq.
Arter & Hadden LLP
1801 K Street, N.W.
Suite 400K
Washington, D.C. 20006

Edgar C. Reihl, P.E.
Shure Brothers Incorporated
222 Hartrey Avenue
Evanston, IL 60202-3696

Edward Abrams, President
Utility Communications, Inc.
920 Sherman Avenue
Hamden, CT 06514

Gary S. Klein
Michael Petricone
George Hanover
Ralph Justus
Consumer Electronics Manufacturers Association
2500 Wilson Boulevard
Arlington, VA 22201

Mary McDermott, Esq.
Personal Communications Industry Assoc.
500 Montgomery Street, Suite 700
Alexandria, VA 22314

Martin W. Bercovici, Esq.
Randall D. Young, Esq.
Keller and Heckman LLP
1001 G Street, N.W., Suite 500 West
Washington, D.C. 20001

Robert M. Gurss
Wilkes, Artis, Hedrick & Lane, Chartered
1666 K Street, N.W.
Suite 1100
Washington, D.C. 20006

Betsy Stover Granger, Esq.
Pacific Bell Mobile Services
4420 Rosewood Drive
4th Floor
Pleasanton, CA 94588

Caressa D. Bennet, Esq.
Michael R. Bennet, Esq.
Gregory W. Whiteaker, Esq.
Edward D. Kania, Esq.
Bennet & Bennet, PLLC
1000 Vermont Avenue, 10th Floor
Washington, D.C. 20005

Peter Carson
ArrayComm, Inc.
3141 Zanker Road
San Jose, CA 95134

Dr. Michael C. Trahos
Region-20 821 MHzPublic Safety Review Committee
Legislative/Regulatory Affairs
4600 King Street, Suite 6K
Alexandria, VA 22302-1249

Edwin F. Kemp
Union Pacific Railroad
1416 Dodge Street
Room 230
Omaha, NE 68179

Kay D. Dallosta

Kay D. Dallosta